

NOTES ON BUTTERFLY MIGRATION. II.

BY HAROLD I. O'BYRNE, Urbana, Illinois.

Williams (1938) has reviewed the recent data on North American migrant butterflies, calling attention to the many gaps that still exist in our knowledge. The following notes on migratory butterflies I have accumulated since the publication of my preceding paper (O'Byrne, 1932) are presented in the hope of making further progress toward filling up these gaps—a task that can be completed only after the accumulation of many more records bearing on this subject.

Danaus plexippus Linn.

A flight of *Danaus plexippus* observed by me in St. Louis, and the adjoining portion of St. Louis County, Missouri, on April 25, 1935, is of interest since it suggests that spring flights of this species may occur frequently without being noticed because the butterflies are so far apart. On this occasion the butterflies were flying northward, and were seen more or less continuously during the day between the hours of 10 A.M. and 6 P.M. They flew for the most part at heights of less than four feet from the ground, rising higher only when necessary to pass objects which they could not fly around, although they seemed to prefer to fly around buildings and other high obstacles. They were therefore frequently diverted from their northward course, but invariably turned to the north again at the first opportunity. The direction of the flight had no relation to the direction of the wind, since there was no perceptible wind that day until the middle of the afternoon, when a strong breeze began to blow from the northwest without causing the butterflies to change their course. All the individuals that passed close enough to permit recognition of the sex were females.

Williams (1930, 1938) cites ten records of migratory flights of this species in Missouri; six of them were southward in the fall, while the direction of the other four was not recorded. Because the northward movement in the spring seems to consist of individuals flying independently, in marked contrast to the large aggregations that cause the southward autumn flights to be so conspicuous, observers of this species in the spring are urged to note the direction of flight of each individual in the hope of determining the frequency and extent of the migrations at this season.

Phyciodes picta Edw.

The range of *Phyciodes picta* does not extend into Missouri.

The only records known to me of its occurrence in that state refer to two specimens taken at Ranken, St. Louis County, on September 19 and October 10, 1937, by Dr. E. P. Meiners of St. Louis, who has kindly given me these data. The occasional occurrence of a species of butterfly far beyond its usual range might be caused by accidental flights of individual butterflies for unusually long distances, or by a temporary extension of the range of the species during a season of unusual abundance, breeding sometimes taking place in the newly occupied territory. Which one of these possibilities was operative in the present instance can not be determined without information as to the presence or absence of *P. picta* in western Missouri and the adjoining states to the west and southwest, during the same autumn.

Ascia monuste Linn.

Migrations of *Ascia monuste* in Florida have been described by numerous observers, whose records are reviewed by Williams (loc. cit.). A flight of this species was observed on June 13, 1936, near St. Augustine, Florida, by my wife and her sister, Miss Dorothy Schregardus. They reported huge numbers of white butterflies flying northward, and captured a specimen which I identified afterwards as a male of *A. monuste*. The flight occurred on a windy day with the wind coming strongly from the east, and the butterflies seemed to keep on the leeward side of the dunes that parallel the seashore. Most of the butterflies were at heights between three and fifteen feet from the ground. The locality and direction of this flight conform to the theory of Fernald (1937) that the migrations of this species are toward the east from somewhere west of New Smyrna, dividing at the seashore to follow the east coast northward and southward.

Phoebis eubule Linn.

Southward migrations of *Phoebis eubule* occur in Missouri every autumn, the density of the migrating populations varying considerably from year to year. In 1938 I noticed the movement on nearly every day from August 25 to September 3 at Webster Groves, Missouri, although the flight was evidently in progress before and after this period. No butterflies were seen on a few cloudy and rainy days; but on bright days during the usual hours of butterfly activity, there was hardly a minute when one or more could not be seen flying a little to the east of a due southerly direction. Many stopped momentarily at flowers to feed, but quickly resumed their flight to the south.

At Urbana, Illinois, no migrating butterflies of this species were

seen in 1938 up to the time of my departure from there on August 12, nor after my return on September 4 through the remainder of September and October, although the flights usually continue during this period in Missouri (O'Byrne, 1933; Brower, 1930). In view of the large number of migrants seen near the eastern boundary of Missouri, the absence of a similar movement in eastern Illinois at nearly the same time indicates that the area or lane in which migration occurs has its eastern edge somewhere in the state of Illinois, or at the Mississippi river. No migrations in Illinois are included in the table in which Williams (1938, fig. 6, p. 229) has summarized all the recorded flights of this species.

Of the instances mentioned above, the true migratory nature of the annual flights of *Danaus plexippus*, in which the same individuals make a return flight, has been fairly well established. The specimens of *Phyciodes picta* captured in eastern Missouri, in the absence of observations of flights in progress, are probably best regarded as individual strays outside the usual range of the species. The frequent movements of *Ascia monuste* in Florida and *Phoebis eubule* in the Mississippi valley are properly described as emigrations, since there is no evidence that any of the butterflies that take part in these flights, nor their offspring, ever return to the regions where the flights originate. Williams (1938), however, gives evidence for a northward spring flight of *Phoebis eubule* in Alabama and Georgia, though such movements have not been reported in other areas. But attempts to classify migrations can be only tentative until adequate information is available on the place and manner of hibernation, condition of gonads at the time of migration, climatic and weather conditions at the start of the flight, and what happens at the end of the flight.

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